
Description

This chapter describes the NT5D51 Meridian Integrated Conference Bridge (MICB) card, both at a system level and at a card level. It describes functions, specifications, applications, engineering guidelines, and operation of the MICB card.

System overview

The MICB is an Intelligent Peripheral Equipment (IPE) card compatible with Meridian 1 options 21E, 51, 51C, 61, 61C, 71, 81, and 81C. It is also compatible with Option 11E/11C system and SL-1 systems NT and XT upgraded to support IPE cards.

The system software required to support all 32 MICB ports is X11 release 22 or later. System software releases X11 releases 19 through 21 support only a maximum of 16 ports. The system software must contain the automatic call distribution (ACD) features and routing software modules to support the MICB operation. The ACD resources should be taken into account in the incremental software management (ISM) of the customer configuration, where each MICB port represents an ACD agent that uses up a DN and a TN from the system resources.

The MICB communicates with X11 system software by emulating a digital line card, which allows the use of the existing software to control the MICB operation. Each MICB port is defined as an automatic call distribution (ACD) ACD agent. All MICB ports are members of an ACD group controlled by an Control DN.

The organization, administration, and management (OA&M) of the MICB card is provided over a terminal or a personal computer using a terminal emulating software. The terminal is connected to the MICB card through the IPE module I/O panel.

The Conference/TDS card is not used in any application with the MICB card.

The terminal can be used by the operator who deals with conference management and the administrator who has additional responsibility such as; system and global conference attributes editing, bridge allocation, control directory numbers and event script editing, and audio recording.

The MICB card has two PCMCIA sockets. PCMCIA hard drive cards are used to store in memory the MICB voice prompts and firmware code. The MICB is shipped with the PCMCIA hard drive. The bottom socket is used to house the PCMCIA hard drive card that contains the current firmware and customer data and the top socket is used for upgrading the firmware.

Multiple MICB cards can be installed into the system, however each card operates as an independent unit and it is not connected to other MICB cards in the system.

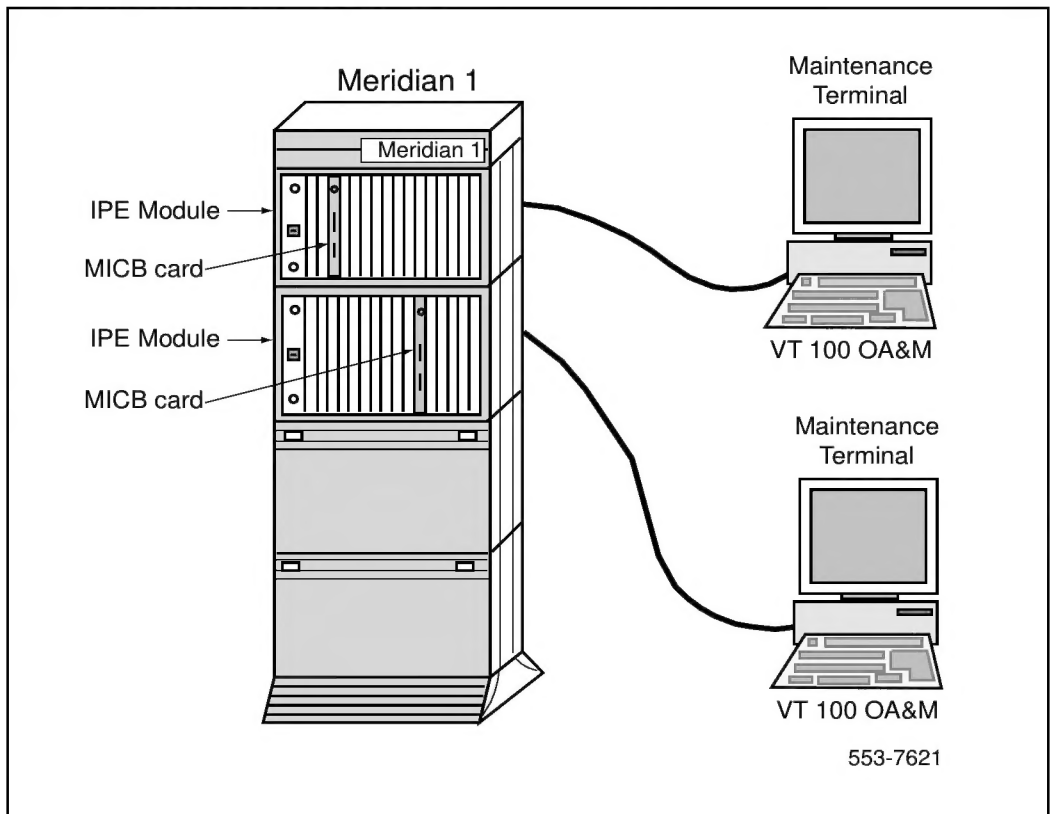
To conduct conference administration and maintenance for that MICB card, you have to connect the terminal to the RS-232 port or the Ethernet connector associated with that MICB card. Each maintenance terminal is connected to each MICB card through an IPE module I/O panel connector or through the Ethernet adapter card.

The Ethernet adapter provides two options:

- Direct terminal connection or modem connection to DB-9 connector
- Ethernet connection, where multiple terminals connected to the Ethernet can access an MICB card

Figure 1 shows Meridian 1 with two IPE modules. This example shows each IPE module with one MICB card and each MICB card is connected to its own maintenance terminal through the associated IPE module I/O panel connector. You can use one terminal for all MICB cards (one at the time) by moving the terminal cable to the I/O panel connector of the MICB card you wish to access.

Figure 1
MICB card in the Meridian 1 system



MICB description

The NT5D51 Meridian Integrated Conference Bridge (MICB) card can be installed into any IPE card slot that is associated with full 50-pin I/O cables. For specific information of the possible IPE card slots where the MICB can be installed, refer to Table 2 “MICB installation card slots in different PE modules” on page 25.

The MICB card provides up to 32 ports that can be partitioned into groups from 1 to 10 where each group represents an independent conference.

Note: Systems with X11 release 22 or higher, support 32 MICB ports, systems with X11 releases 19 through 21, support only 16 ports.

Each MICB port is configured as an ACD M2616 digital telephone set. The Meridian 1 system ACD function routes the incoming calls to the MICB, where each MICB port is treated as an ACD agent. All MICB ports belong to the same ACD queue and are treated as a pool of ports with equal status. For ACD DN and Control DN description, refer to “Configuring the MICB ports” on page 18.

The MICB supports several conferences simultaneously. The number of conferences depends on the number of MICB ports available and the number of participants (conferees) in each conference. For an MICB with 32 ports, there can be a maximum of 10 conferences with three or four participants in each conference, 1 conference with a maximum of 32 participants, or any combination in between.

The CDNs and the corresponding TNs are system resources, which when assigned to the MICB ports cannot be used for other Meridian 1 stations. For an MICB with 32 ports, a maximum of 10 simultaneous conferences would require 20 CDNs and 20 TNs.

The main hardware and functional characteristics of the MICB card are described in:

- MICB functional characteristics
- MICB hardware design characteristics

MICB functional characteristics

The function of the MICB card is to schedule and administer multiple simultaneous conferences. These conferences are scheduled based on time-of-day, duration of each conference, and number of conferees or ports allocated for each conference.

It provides pre-programmed announcements and tones that correspond to specific events during conferences to advise the chairperson and other conferees of the status of the conference connection, indication when a conferee joins or leaves the conference, warns the chairperson and the conferees when the scheduled conference time is about to expire, etc.

System compatibility features:

- compatible with the IPE module in any system that supports IPE
- emulates a digital telephone set, such as M2616, on each MICB port
- supports both the A-law and the μ -law signal coding/decoding
- provides full duplex communication
- supports DTMF detection
- provides system reporting

Features supported through the MICB DSP firmware:

- selects two active speakers in a conference of up to 32 conferees
 - analyzes the loudness of all received signals continuously and selects the two loudest signals to be the two active speakers
 - the two speakers are not selected globally, but based on the signal strength associated with each timeslot.
- handles 2-way conversation in conferences with 2 to up to 32 conferees
- supports a maximum of 10 simultaneous conferences
- normalizes the PCM input samples
- handles both A-law and μ -law companding
- provides gain control on all output samples

MICB expansion options:

- software upgrade using the PCMCIA Flash card
- port expansion by providing keycode selectable options of 12, 16, 24, or 32 ports

MICB conference features:

- provides for one or more permanent bridge configurations
- supports multiple conferences simultaneously
- allows conference extension beyond the scheduled time
- allow number of conferee expansion if MICB ports are available
- supports up to five different languages on each PCMCIA hard drive
- provides conference security (password option)
- automatically starts and terminates conferences based on reservations scheduled in advance
- issues 10-minute warning before the conference termination
- support of dial-in conference
- provides conference entry and exit tones or messages
- allows conference music turn off for the first conferee joining the conference
- controls access to the conference in progress by monitoring the maximum number of scheduled attendees at each conference
- manages time and date for scheduled conferences, reserves ports for each conference, and prevents overbooking of ports
- provides recorded announcements and tones to ports and conferences by playing pre-recorded files stored on the PCMCIA hard drive card
- supports brand line greeting (a customized greeting for each language)
- supports administration features such as; system configuration, scheduling, management, and report generation
- routes conferees to the appropriate conference based on the dialed directory number (CDN)

- issues audible responses to conferees based on the conference activity
- provides conference traffic report

Chairperson's features:

- provides for one chairperson per conference
- allows conference music turn off if the chairperson is first to join the conference (or turn on the music if the music is off)
- allows the chairperson to dial *0# to get assistance
- allows chairperson's access and command execution such as; dial-out, drop conferees, count conferees, and lock/unlock conference

MICB hardware design characteristics

An MICB card occupies one IPE slot in an IPE module.

The MICB card has the following hardware interface characteristics:

- uses the MPU based on the 25MHz MC68EN360 Integrated Communications Controller
- uses standard interface buses and PCMCIA cards and handles MS-DOS compatible file on the PCMCIA storage device
- accesses all 32 DS-30X voice/signaling timeslots
- provides echo cancelling
- supports automatic gain control
- supports Card-LAN interfaces
- Performs X12 signaling protocol messages for input/output
- Uses Digital Signal Processor (DSP) for conferencing and DTMF detection
- Provides self-test of internal hardware components and allows card monitoring and maintenance through the maintenance port
- Provides one RS-232 serial port for administration and maintenance access
- provides optional Ethernet interface over the MMI

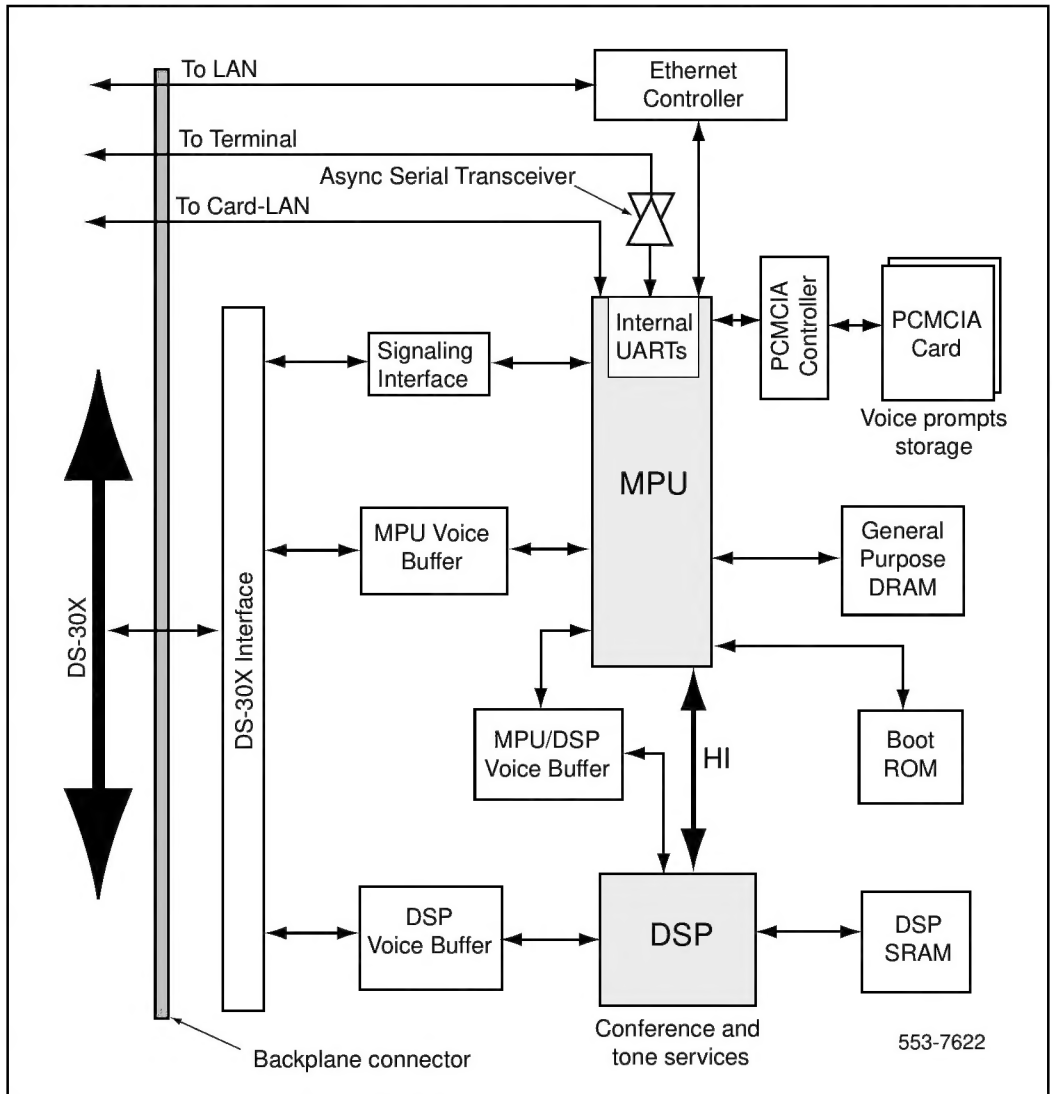
[Table 1](#) describes each hardware component provided for the MICB application. These components are used to connect the MICB to the maintenance terminal locally and remotely.

Table 1
MICB hardware list

Component	Description
NT5D51 MICB Card	An IPE card that provides bridge and conference scheduling for up to 10 simultaneous conferences. (The NT5D51 MICB card, the Security Device, and the NT5D62 PCMCIA hard drive card, all together are packaged as NT5D32).
NT5D62 PCMCIA Hard Drive Card	This PCMCIA card contains the MICB software and configuration. It must be installed into the lower PCMCIA drive for the MICB to operate.
NT5D52AA Ethernet Adapter card (for IPE module installation)	This adapter card is installed on the IPE module I/O panel only if the MICB is to be connected to the Ethernet.
NT5D52BA Ethernet Adapter card (for Option 11C/11E installation)	This adapter card is installed into the Option 11C/11E tip/ring connector only if the MICB is to be connected to the Ethernet.
NT5D19AA Maintenance cable	This cable is used to connect the terminal to the 50-pin tip/ring connector on the IPE module I/O panel or the Option 11C or 11E tip/ring connector. This cable requires a nullmodem for proper connection to the MMI terminal.
A0601396 Nullmodem	Compact DB-25F/DB-25M nullmodem adapter.
A0601397 Nullmodem	Compact DB-25F/DB-25F nullmodem adapter.
A0601464 Nullmodem Maintenance cable	This cable has a DB-9 female and a DB-25 male connectors and it is used to connect the terminal to the MICB using the Ethernet Adapter card DB-9 male connector. No additional nullmodem is required.

Figure 2 shows a high level block diagram of the MICB card components. It also shows the MICB interfaces at the IPE module backplane connector.

Figure 2
MICB block diagram



Micro Processing Unit (MPU)

The MPU coordinates and controls data transfer and addressing of the peripheral devices. Tasks that the MPU performs depend on the interrupts it receives. These interrupts are prioritized by the importance of the tasks they control.

The MPU is highly integrated and provides most of the decision making logic on the chip. Functions of the MPU include controllers, timers, control logic, address decoding, DRAM and independent direct memory access, Ethernet terminal and Card-LAN input/output ports, and independent full-duplex serial communication channels that support various protocols.

The MPU can be reset by:

- powering up the MICB card
- entering reset command on the MMI
- the watchdog timer

A resident boot code contained in Flash memory start the process of bringing up the MICB. This boot code loads a start-up program from a fixed location on the PCMCIA disk. The start-up program performs basic diagnostics and loads the main code to the RAM.

Digital Signal Processor (DSP)

The DSP communicates with the MPU over the host interface (HI) and the MPU-DSP voice buffer. It also communicates with the DS-30X interface over the DSP voice buffer. The DSP can access program and data stored in the DSP SRAM. The PCMCIA Flash card must always be installed in the low PCMCIA slot on the MICB.

Memory

The MICB card contains the following memory types:

- general purpose DRAM.
- Boot ROM.
- DSP SRAM.

Additional memory is available when the PCMCIA card(s) are installed into the MICB card.

Card-LAN interface

To implement the Card-LAN interface, the MICB card uses an internal UART device. The UART channel is a serial communication interface to Peripheral Controller card.

The Card-LAN is a 19.2 kbps asynchronous interface. It is used to poll and communicate with the Peripheral Controller card to transmit maintenance messages, which include:

- LED control of the IPE card enable/disable
- MICB card configuration
- MICB card type and version information

DS-30X

A DS-30X network loop is composed of two synchronous serial data buses that transport data:

- One bus transmits data toward the line facility (Tx)
- The other bus receives data toward the Meridian 1 CPU (Rx)

DS-30Y network loops extend between controller cards and superloop network cards, and function similarly to DS-30X loops. Essentially, a DS-30Y loop carries the PCM timeslot traffic of a DS-30X loop, but up to four DS-30Y loops form a *superloop* with a capacity of 128 channels (120 usable timeslots).

RS-232 port

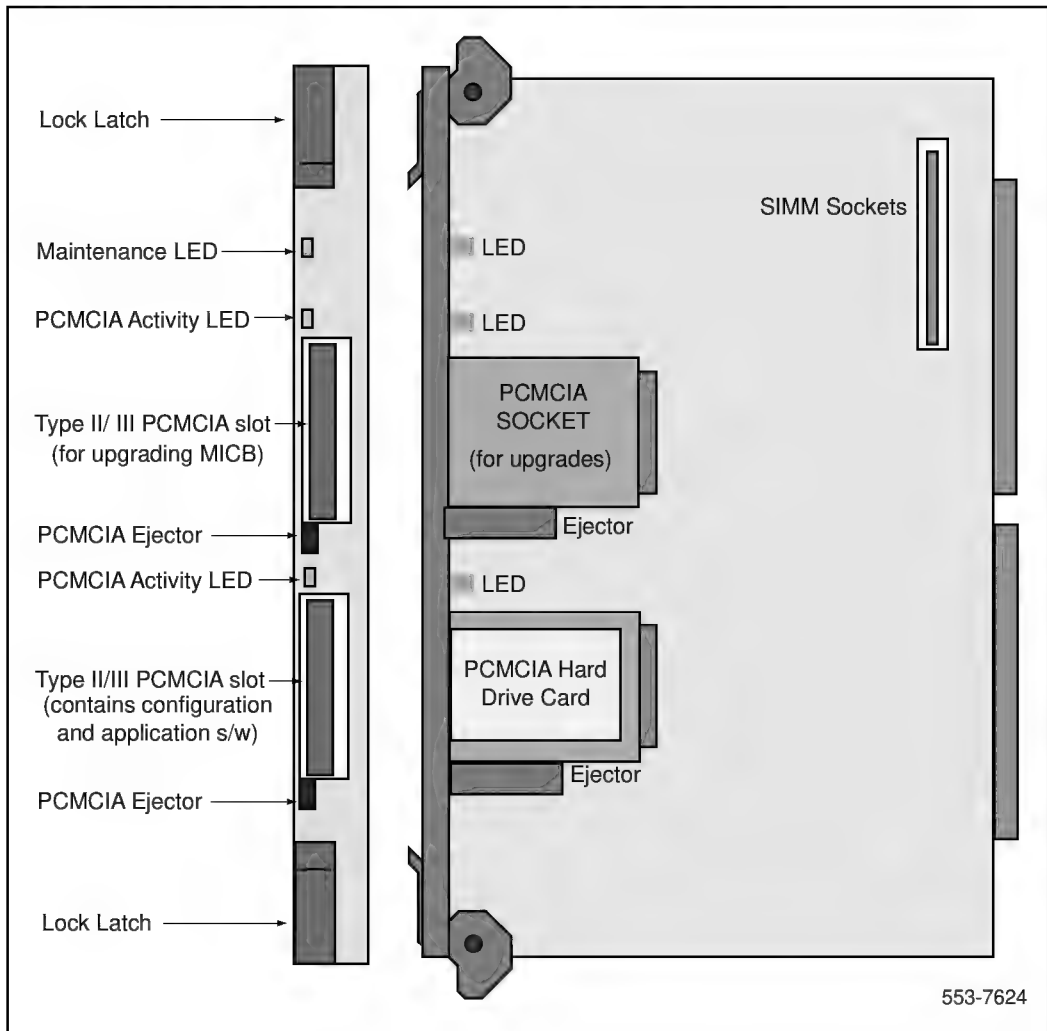
A serial port is provided on the MICB card for administration and maintenance functions. Access to this port is over the IPE module backplane connector to the I/O panel and from the I/O panel to the terminal.

Ethernet interface

An Ethernet interface on the MICB is provided at the I/O panel by installing the Ethernet adapter. This adapter provides an Ethernet RJ-45 and a DB-9 connector. There are two options of the Ethernet adapter cards; one for Option 11E/11C and the other for Meridian 1 options 21E, 51, 51C, 61, 61C, 71, 81, and 81C, refer to Table 1 “MICB hardware list” on page 10. Also, refer to “Ethernet application” on page 30. You can have multiple terminals on the network be able to access the MICB card.

[Figure 3](#) illustrates the component side of the MICB card and the faceplate. The component side shows the DRAM and the PCMCIA socket locations. The faceplate shows the card LED and the PCMCIA activity LED indicators and the slot locations for PCMCIA cards.

Figure 3
NT5D51 MICB card



Faceplate sockets and indicators

The MICB faceplate provides:

Card LED. The MICB faceplate provides a red card LED to indicate the enabled/disabled status of the card and to indicate the self-testing result during power up or card insertion into an operating system. This LED indicates the following:

- LED is ON when the MICB card is disabled
- LED is OFF when the MICB card is enabled and ready for use
- LED is BLINKING three times and stays ON (until is software enabled) when the MICB card has successfully completed self-test

PCMCIA activity indicator LEDs. These LEDs are next to the PCMCIA slots and indicate the following:

- LED is ON when the PCMCIA card is disabled
- LED is OFF when the PCMCIA card is enabled and ready for use
- LED is BLINKING when the PCMCIA card is in use

Type II/III PCMCIA slots. The MICB faceplate provides two Type II/III PCMCIA card slots. These slots are use to house the PCMCIA cards. The lower slot is used to install the PCMCIA hard drive card that stores voice prompts and firmware code. The upper slot is used for upgrading the firmware, when required.

MICB operation

The MICB card continuously monitors the audio signal level received from each conferee and selects the two loudest signals for transmission. The two loudest signals are summed and inserted into the PCM sample prior to their transmission to other conferees. This implementation of the two loudest signals improves the interrupting capability of a conference connection and allows normal two way conversation that all conferees can hear.

In addition to the conferee timeslots, the MICB provides a timeslot between the MPU and the DSP. This timeslot transmits message prompts and/or entry and exit tones that are broadcasted to all conferees when requested by the MPU.

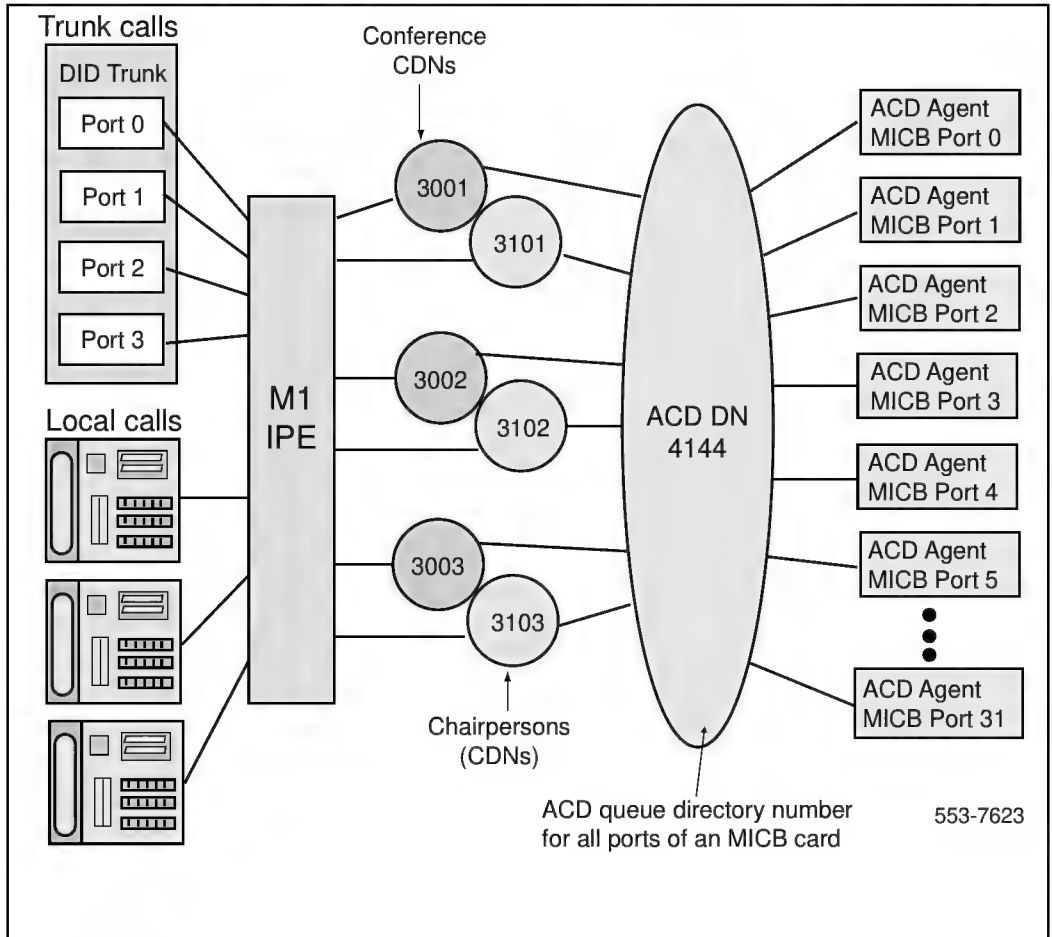
The MICB card uses the system ACD features to schedule multiple simultaneous conferences, to route external incoming trunk and local line conferees to their appropriate conferences, to provide queuing, chairperson feature, and events reporting for each conference activities on an MICB card.

The ACD features used by the MICB card provide:

- expanded number of ports in the same pool allowing up to 1200 ACD agents for Meridian 1 systems and up to 120 for the Option 11E/11C system
- Meridian 1 options 21E through 81C support 240 CDNs or ACD DN's
- Option 11E/11C supports 100 CDNs or ACD DN's
- simple software configuration
- queuing of incoming calls, announcement on arrival, call management, and reporting
- operational statistics reports
- enhanced call routing

Figure 4 illustrates the call routing for three conferences. It shows the conference chairperson access control directory number (CDN) for each conference and the ACD DN for the ACD queue that controls the path of all ports on an MICB card. The right-hand-side of the figure shows the distribution of MICB ports as ACD agents.

Figure 4
Call routing with chairperson access



Configuring the MICB ports

Ports on the MICB card are configured as ACD digital sets, where each port is considered to be an ACD agent. All ports on an MICB card belong to an ACD queue (group). This ACD queue is identified with an ACD directory number (ACD DN) that handles the connection of conferees (ACD agents) to the appropriate conference Control Directory Number (CDN), which represents the specific conference.

Each conference has assigned a unique CDN and a chairperson CDN. The CDN's are configured in Meridian 1 at the time the MICB card is installed. The total number of CDN's is equal to two times the number of simultaneous conferences. Example, if there are ten conferences, there will be twenty CDN's one for the chairperson and one regular conference CDN that each conferee dials to join the conference.

Joining the conference

When several conferences take place simultaneously in the same MICB card, the conferee dials the CDN assigned to a specific conference. The MICB card recognizes the dialed CDN and routes the conferee to the appropriate conference represented by that specific CDN. All ports belonging to an MICB card are routed to the appropriate conference (CDN) through the ACD DN assigned to that MICB card i. e. that ACD queue. The chairperson dials the chairpersons CDN to access their specific conference. This number is different than the CDN dialed when the conferees are accessing that same conference.

The MICB performs DTMF detection only on MICB ports tagged as chairperson ports. The DTMF also detects when conferees enter the password. A conference may start without the chairperson and if all allocated ports for a conference are occupied with conferees, the chairperson will not be allowed to join the conference unless conference expansion is allowed and there are free un-scheduled (floating) ports available.

The first conferee joining the conference hears an announcement that indicates that no other conferee joined the conference yet and this announcement is followed by 60 seconds of music. This announcement with 60 seconds of music is repeated continuously until at least one more conferee joins the conference.

The MICB provides flexibility in configuring conferences. They can be configured as:

- pre-scheduled conference with fixed number of ports, fixed start and stop times
- pre-scheduled elastic conference with variable number of ports where they are added when required (if available) and subtracted as people leave the conference
- permanent bridge with fixed number of ports that can be used without pre-scheduling the conference

Expanding the conference

Conference expansion may be allowed or denied by using an administration command. This feature is enabled during the conference scheduling. If enabled, the number of conferees belonging to a conference can be expanded as long as there are a sufficient number of the remaining MICB ports to satisfy other simultaneous pre-scheduled conferences.

When reserving the MICB ports for each simultaneous conference, specific ports are not tagged for a specific conference. The MICB counts the number of reserved ports and compares them against the total number of ports provided by the MICB card and makes sure that the reserved ports do not exceed the total number of ports provided by the MICB card.

If additional (not scheduled) callers attempt to join a conference, but they are not allowed due to lack of floating ports or locked conference, the MICB card will issue an overflow tone and then disconnect the call.

If un-scheduled (floating) ports are released from a conference, they are immediately available to be used by conferees of other conferences if the expansion feature is enabled.

The minimum duration of a conference is 15 minutes and the maximum duration of a time-limited conference is 12 hours. Scheduled conference starting time and conference duration is incremented in steps of 5 minutes.

Ending the conference

When the conference was scheduled, the conference number of ports, start time, and duration were specified. The conference will end at the predetermined time, which is based on the start time and conference duration. Ten minutes before the end of the conference, the MICB card issues an announcement warning the conferees that the conference will terminate in 10 minutes.

When the conference time is up, the MICB card issues to conferees the final warning and it also send the release message to Meridian 1 for all the associated MICB ports. These ports now become available for the next pre-scheduled conference, or if not scheduled, they become floating ports not reserved for any other conference and can be used to expand conferences in progress if the conference expansion feature is enabled.

Individual conferees may leave a conference in progress at any time. The MICB detects a conferee leaving the conference, and exit prefix announcement is inserted in the conference and the conferee's name is announced, if this feature is enabled. When only one conferee is connected to the conference, an announcement is issued indicating that only one conferee is present followed by 60 seconds of music. This announcement and the music is repeated continuously until at least one more conferee joins in, or the conference is terminated.

Note: A conference may begin and end two minutes before the specified time. This feature allows the system to close all terminating conferences two minutes earlier and start all conferences that should be started immediately after the terminating conferences are closed. This feature is important when terminating and starting conferences use some common CDNs.

Chairperson's function

The chairperson can control conference activities by executing commands on his/her telephone set. These commands consist of an asterisk (*) followed by one or two digits. If a star (*) is dialed only, after 5 seconds the command times out. If 2 stars are dialed (**), the command is aborted. These commands control the following functions:

Dial-out

The chairperson can dial out and call a new party outside of the conference with the intention to only confer with the party, or to include the party into the conference. To do this the chairperson dials *0DN# to dial a party outside the conference, or *0 to access the operator. The chairperson can then decide to bring the party into the conference by executing the *2 command or disconnect the call by executing the *3 command. If you dial the wrong number, you can dial *3 and re-dial. To redial the last number dialed, the chairperson dials *#.

The port for dialing out is selected by the MICB card and is available if the number of ports reserved for the conference is greater than the number of conferees that have joined the conference. The port may also be available if all the reserved ports are occupied for that conference, but there are some un-reserved ports available on the MICB card and the port expansion feature is enabled for that conference. If all reserved ports are occupied and there are no unscheduled ports available, the call will not be completed.

Note: When the chairperson dials out, two ports are seized, the dial-out port of the local MICB and the dial-in port of the remote MICB. This connection can be terminated only if the chairperson drops the dial-out port of the local MICB.

Drop all conferees

The chairperson can drop all conferees from the conference except the chairperson by executing the *90 command. No announcement is issued to the conference before disconnecting the conferees if the chairperson is still connected. The chairperson is the only one still connected. The MICB card issues an announcement indicating that no other conferees are connected to the conference followed by 60 seconds of music. This announcement with 60 seconds of music is repeated continuously until at least one conferee joins the conference or the conference is terminated.

Drop last dialed conferee

The chairperson can remove the last conferee that dialed in or was included into the conference by the chairperson dialing out and including the called party into the conference. To drop the last conferee joining the conference by dialing out, the chairpersons executes the *91 command, to drop the last conferee that joined the conference by dialing in, the chairperson executes the *92 command.

Count conferees

The chairperson can count the number of conferees that joined the conference by executing the *6 command. The MICB card issues a string of voice prompts one for each conferee in the conference. If a new conferee joined the conference after the command was invoked, that new conferee will not be counted.

When you dial *6 the conferees will hear a faint click when the * is dialed.

Lock or unlock the conference

The chairperson can lock the conference to prevent any new conferees from joining the conference by executing the *4 command, or can unlock the conference by executing the *5 command and allow new conferees to join the conference. A caller attempting to join a locked conference hear an announcement indicating that the conference is locked and the connection is dropped. The chairperson can dial-out and include a conferee even if the conference is locked.

The chairperson trying to lock or unlocked the conference will hear normal confirmation tone as if the command was executed.

MICB capacity expansion

The MICB card can be configured to provide a maximum of 12, 16, 24, or 32 ports. To activate a different number of ports than currently active, you must access the General Administration commands *Functionality Upgrade* menu and select *Modify* to change the maximum number of ports to be activated, and then *Save* to save the changes.

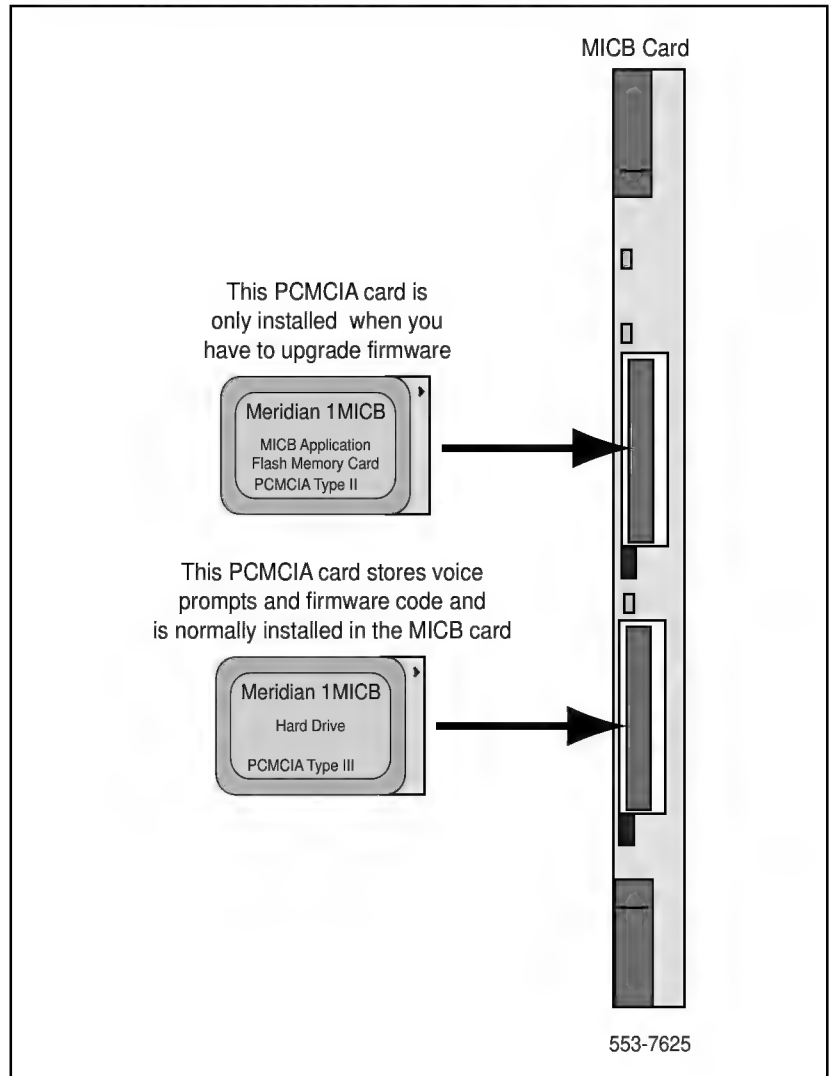
After the changes were saved, you must enter the correct keycode that will allow the changes to be activated. The keycode is 24 characters long entered in three sets of 8 digits called key-code1, key-code2, and key-code3. Refer to the Administration chapter of this document for details.

External memory expansion, new voice announcements, and firmware upgrade can be accomplished by inserting a PCMCIA card into the top PCMCIA slot accessible through the MICB faceplate.

The available storage for voice prompts on the PCMCIA disk is 130 Mbytes, providing 260 minutes of voice recording. The MICB uses the PCMCIA ATA, Type II and Type Flash cards for MICB software upgrade and backup.

Figure 5 illustrates how PCMCIA cards are loaded into the MICB faceplate slots to upgrade the MICB capacity.

Figure 5
Installing a PCMCIA card into the MICB faceplate slot



Security

A keycode is implemented to protect against unlawful MICB feature usage, because industry-standard PCMCIA cards are used as the software medium on the MICB. All upgrades of either port capacity or application software are restricted to a given MICB card and are accurately tracked to allow for satisfactory handling of field repairs and incremental upgrades.

Security is required for the following upgrades:

- port capacity upgrades
- feature enhancements
- new applications

Security is not required for the following upgrades:

- backup and restore operations
- application patching/bug fix

Nortel provides the customer with a keycode to enable them to install any desired upgrade. The keycode is entered over the local maintenance port on the MICB card. The keycode is 24 characters long and is entered in three sets of 8 digits called key-code1, key-code2, and key-code3.

Keycodes can enable additional functionality within an existing application (adding ports, features, etc.) or can be used with a PCMCIA card to provide new software or pre-recorded announcements.

Engineering guidelines

Meridian 1 general system engineering guidelines are described in *Meridian 1 system engineering* (553-3001-151). The following information deals specifically with engineering guidelines for the MICB planning and implementation. For system integrity and standards, refer to “Appendix B: Product integrity” on page 119.

System compatibility

Each MICB port is emulating a digital set assigned to an ACD agent. All ports on an MICB card belong to an ACD queue, which is controlled by the ACD DN assigned to that specific MICB card.

To support a maximum of 32 ports, the Meridian 1 system must be running on X11 release 22 or later software. Software X11 release 19, 20, and 21 supports a maximum of 16 ports. Starting with X11 release 22, the software provided for flexible voice and data TN feature allowing configuration of up to 32 ports.

The MICB is supported by:

- Meridian 1 options 21E, 51, 51C, 61, 61C, 71, 81, and 81C
- SL-1 systems NT and XT upgraded to support IPE cards
- Option 11E, 11C

[Table 2](#) lists the Meridian 1 modules and the card slots suitable for MICB installation. The MICB card may be installed in to the following IPE card slots:

Table 2
MICB installation card slots in different PE modules

Meridian 1 modules	MICB card slots
NT8D37BA/EC IPE modules, NT8D11BC/ED CE/PE modules	All available IPE card slots.
NT8D37AA/DC IPE modules	0, 4, 8, and 12
NT8D11AC/DC CE/PE modules	0

System resources

The system ACD resources should be taken into account. Incremental Software Management (ISM) for the specific Meridian 1 system option must be reviewed. Each MICB port represents an ACD agent that uses up a DN and a TN from the total system resources. A maximum of 20 DNs (CDNs) are required for each MICB. These resources must be decremented from the overall system resources.

These resources must be subtracted from the overall system resources and cannot be used for any other application as long as they are assigned for MICB use. Refer to “Engineering multiple simultaneous conferences”, on the next page, for the system resource allocation.

Required software packages

In addition to the standard X11 release software, the system must be equipped with the following software packages to allow the MICB card to operate as intended:

- ACD basic package (45)
- ACD advanced features (41)
- Enhanced ACD routing (214)
- Digital set (88)
- End-to-end signaling (10) - required if chairperson calls locally within the same switch

Engineering multiple simultaneous conferences

The MICB card can be configured to provide a maximum of 12, 16, 24, or 32 ports. To activate the selected number of maximum ports, a keycode consisting of 24 digits is required. Refer to the *MICB administration* chapter of this document for details.

For the list of MICB features and functions, refer to “MICB functional characteristics” on page 7.

To provide multiple simultaneous conferences on one MICB card, the following system resources must be specified:

- 1** Activate the maximum number of MICB ports required for your site. If the current number of active ports is sufficient to meet the requirements or if all 32 ports are enabled, skip this step.
- 2** Assign one ACD DN (automatic call distribution directory number including its queue and data block). One ACD DN is required for each MICB card.
- 3** Specify CDNs (control directory numbers) and their data blocks. All CDNs should be accessible by DID trunks. To determine the number of CDNs:
 - Determine the maximum number of simultaneous conferences on the MICB card.
 - Multiply the number of conferences by 2 to determine the number of CDNs required (each conference requires 2 CDNs - one for the chairperson and one that conferees call to access the conference). Example: 10 simultaneous conferences require 20 CDNs.
- 4** Assign DNs (directory numbers) and corresponding digital set data blocks. Each configured MICB port appears as a digital set of an ACD agent. The number of DNs is equal to the maximum number of ports provided by the MICB card. For an MICB with 32 ports active, you require 32 telephone set (agent) DNs and the corresponding 32 TNs.

Environmental and power requirements

The environmental requirements for the MICB must meet or exceed the overall Meridian 1 system requirements. The power provided for each card slot in the IPE module exceeds the power requirements for an MICB.

Environmental requirements

[Table 3](#) shows the operating and storage environmental specifications. Ideally the system should operate in a stable environment at 22° C (72° F). However, the system is designed to operate in the temperature and humidity ranges specified in [Table 3](#).

Table 3
Environmental requirements

Condition	Environmental specifications
Operating	
Temperature	0° to 50° C (32° to 122° F)
Relative humidity	5% to 95% noncondensing
Altitude	3,048 meters (10,000 feet) max
Storage	
Temperature	–50° to 70° C (–58° to 158° F)
Relative humidity	5% to 95% noncondensing

Power requirements

Power to the MICB is provided by the IPE module power supply (AC or DC). Refer to [Table 4](#) for a display of the MICB power requirements and also to the *Meridian I power engineering* (553-3001-152).

Table 4
MICB power requirements

Voltage	Source	Current
+5 V	Backplane	3.0 A
+15 V	Backplane	0.25 A
Total maximum power		18.75 W

The maximum IPE module per slot power budget is 30 Watts, with an effective limitation of 20 Watts for thermal compensation. The MICB card does not exceed the power allocated for each card slot in the IPE module.

Table 5 lists the transmit and receive analog signal levels as measured at the transmitter output and receiver input in the MICB card.

Table 5
Voice signal level specifications

Signal Direction	Minimum Power	Maximum Power
Transmit signal	-55 dBm0	0 dBm0
Receive signal	-55 dBm0	0 dBm0
<i>Note: For other signal characteristics, refer to <i>Summary of transmission parameters</i> (553-2201-182)</i>		

External equipment

To perform OA&M sessions you must connect a terminal or a PC emulating a terminal to the MICB card.

VT100 type terminal

A VT100 terminal or a personal computer emulating a terminal is used to perform MICB administration, configuration, and maintenance and diagnostics.

The terminal must be connected to the MICB RS-232 interface. The terminal can be connected as follows:

Direct connections:

- directly to the IPE module I/O panel or Option 11 C/E 50-pin connector
- directly to the DB-9 connector on the NT5D52 Ethernet Adapter card installed on the I/O panel

Remote connections:

- to the IPE module I/O panel or Option 11 C/E 50-pin connector through a modem connection

- to the RJ45 jack on the NT5D52 Ethernet Adapter card to the Ethernet for remote multi-terminal access to the MICB

Terminal interface must be set at 9600 baud, 8 data bits, 1 stop bit, and no parity. The flow control is hard wired (never use XON/XOFF flow control).

Ethernet application

Ethernet implementation over the MICB has the following characteristics:

- The MICB Ethernet connection is separated from the external LAN traffic by a firewall.
- The Ethernet Adapter options for MICB are:
 - NT5D52AA for the IPE module application
 - NT5D52BA for the Option 11E/11C application
- The Ethernet provider assigns the IP address for the MICB. The IP address is entered over the MMI terminal.
- To access the MICB over the Ethernet, the terminal or a PC must emulate a VT100 terminal.